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ON THE "SEDATIVE" ACTION OF CALOMEL IN DISEASE.¹

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"It may seem that any remarks, at the present day, on the principle or method of using *calomel*, must be trite, and altogether needless." This is the opening sentence of Sir Henry Holland's essay on "Mercurial Medicines," written thirty years ago. The same idea probably occurred to many of my present audience on hearing the subject of this essay announced. Those of you who have had the pleasure of reading the valuable essay of this distinguished writer, have, no doubt, risen from its perusal with a very different opinion. Although I cannot expect to afford you the pleasure and profit for which one may always confidently look in the discussion of any subject, however trite, by so able and classical a writer, yet I trust you will all agree that we have something still to learn of the mode of action, and especially the various applications, of this valuable but much-abused remedy; and possibly some

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of you may agree with me in the belief that we, as yet, know little or nothing of some of its most remarkable capabilities, of its most valuable adaptations to the arrest or relief of some of the most fatal affections of the system. I beg leave to apologize to the Society, at the outset, for the hurried and incomplete manner in which I have been compelled to handle this important topic, in consequence of the imperative demands and constant interruptions of general practice, which all of you will, no doubt, appreciate. On this account, I should not, at this time, have presented the subject for your consideration, but, having waited so long in the vain hope of a better opportunity, I have concluded to throw myself upon your indulgence.

The writer does not propose to advance any absolutely novel or startling ideas concerning the use of mercury, or *calomel*, which is taken as its great representative, and by far its most valuable combination, but rather to recall your attention to some of the oldest methods of its administration, never generally appreciated, and long ago abandoned by the greater portion of the profession.¹ I allude to the employment of the remedy in large, or, as the old term is, "heroic" doses; a scruple to half a drachm. It is astonishing that, in the case of a drug so universally employed by the profession, for so many centuries, and concerning which so much has been written by a host of the most able writers on medical science, there should be no settled principle of action established with regard to it, no definite rules for its application: indeed, that we should have to go back to the older writers to discover the most important indications which it is capable of fulfilling.²

¹ Waring asserts, in his remarkable work, that "the *scruple doses*, advocated by Johnson, Annesley, and others, have been entirely abandoned." This is rather too sweeping an assertion. But many, who have, of late years, used them successfully, have shrunk apparently from advocating them publicly.

² "At the present day" (the first quarter of the present century), says Annesley, "Sketches of the Diseases of India," p. 367, "the opinions of practitioners, both in Europe and in India, are as various regarding the use or abuse of calomel, and the modes of exhibiting it, as at any former period."

Of late authors, Billing ("First Principles of Medicine") contends that it produces contraction of the capillaries, and thus relieves irritation and

The use of these large doses dates back at least as far as the middle of the seventeenth century, and the authors of that period, as Horstius, Sylvius, Juncker, Geoffroy, etc., exhibited these doses neither indiscriminately nor aimlessly; for they well understood, according to Annesley, the effect of smaller doses in producing ptyalism, and gave the larger doses for its far more important action. Subsequently, a dread of these potent doses spread itself over the minds of the profession, and the smaller doses were again substituted. Thus ptyalism was induced before any other manifest effect on the system was observed; and finally, this manifestation of its absorption into, and contamination of the blood, came to be generally recognized as necessary, in fact, as the *means* of ridding the system of the prevailing disease; a most unfortunate and fatal deduction. This timidity in the application of the remedy has proved to be the principal cause of its great abuse in subsequent times. Later, a revival in the use of calomel occurred, and we must attribute this to James Johnson.¹ His attention seems first to have been attracted to it accidentally, and painfully too. The history of his own case is so pertinent and instructive, that I venture to give the concluding paragraphs in his own words; premising that he contracted the disease (dysentery) while hunting on the banks of the Ganges; that his medical attendants put him upon the usual treatment (calomel in small doses, and combined with opium, and mercurial inunction), and continued this for a couple of days; that he constantly grew worse. He says that, at this stage—

inflammation; while Headland ("Action of Medicines") flatly contradicts this assertion.

But it is scarcely necessary to quote further proof of what has been asserted, as all must be assured of the unfortunate diversity of opinion regarding this subject.

¹ Stillé, in his work on "Therapeutics and Materia Medica," attributes this (doubtful, as he considers it) honor to Annesley. But he is as much in error in this, as in his ideas of the objects and principles which guided this writer in his use of the remedy. Almost all, indeed, of our later writers on these branches of medical science, seem to exhibit this same want of appreciation of the objects aimed at, or attained, by those authorities who have had the tact and prudence to administer calomel in "heroic" doses, but in a proper manner, and in suitable cases and stages of disease.

"The surgeon endeavored to cheer me with the hope of ptyalism, which, he assured me, would alleviate my sufferings. I had then no local experience in the complaint myself. As the night advanced, all the symptoms became aggravated, and I was convinced that a fatal termination must ensue, unless a speedy relief could be procured. I had no other hope but in ptyalism; for my medical friend held out no other prospect. I sent for my assistant, and desired him to give me a scruple of calomel, which I instantly swallowed, and found that it produced no additional uneasiness; on the contrary, I fancied it rather lulled the tormina. But my sufferings were great—my debility was increasing rapidly, and I quite despaired of recovery! Indeed, I looked forward with impatience to a final release! At four o'clock in the morning, I repeated the dose of calomel, and at eight o'clock [or between sixty and seventy hours from the attack] I fell, for the first time, into a sound and refreshing sleep, which lasted till near midnight, when I awoke. It was some minutes before I could bring myself to a perfect recollection of my situation prior to this repose; but I feared it was still a dream, for I felt no pain whatever! My skin was covered with a warm moisture, and I lay for some considerable time without moving a voluntary muscle, doubtful whether my feelings and senses did not deceive me. I now felt an uneasiness in my bowels and a call to stool. Alas, thought I, my miseries are not yet over! I wrapped myself up, to prevent a chill, and was most agreeably surprised to find, that with little or no griping, I passed a copious, feculent, bilious stool, succeeded by such agreeable sensations—acquisition of strength, and elevation of spirits—that I ejaculated aloud the most sincere and heart-felt tribute of gratitude to Heaven for my deliverance."

Now, this graphic account introduces us to what I wish particularly to direct your attention to, the *sedative* power of calomel in large doses; for its action in this case could not probably have been supplemented by any other remedy known then, or subsequently discovered, as I have ascertained by actual experience. After some years, another reaction in the history of the remedy occurred; and, in our modern treatises, these "heroic" doses are, with very few exceptions, only mentioned to be condemned.

The writer's first experience with sedative doses was in epidemic dysentery. An account of this was published in the *New York Journal of Medicine* for March, 1856, and I quote a few lines from it: "Large doses of opium (three to four grs.), and large anodyne enemata (3 i to 3 ij), failed to bring any relief to the distressing tormina and tenesmus. The efficacy of scruple-doses of calomel, so highly recommended by Johnson, An-

nesley, and others, and recently indorsed by the high authority of Prof. Dickson, of Charleston, was then tried, and with signal success. Its action was usually this: it was generally administered in the early stage of the disease" (only in the severe cases), "very often as the first prescription" (most of the patients having tried various remedies before I was called). "The patient would be suffering the most intense cutting pain across the abdomen, often accompanied by considerable tenderness on pressure, distressing tenesmus, and passing blood or bloody mucus every ten or fifteen minutes, and earnestly desiring some immediate relief. One scruple of calomel was then given; within an hour, generally (sometimes in half an hour, once in fifteen minutes), relief, sometimes complete, would be obtained." For five or six hours after, frequently eight to ten hours, there would be no discharge from the bowels, and very little uneasiness of any kind. In a few cases, the bowels were constipated for twelve hours or more, requiring a dose of castor-oil to move them. Generally, after two or three hours' relief, the patient would have two or three loose bilious evacuations, brownish or greenish, sometimes attended by some pain and griping, sometimes not. In not a few cases, the distressing symptoms did not recur at all, and convalescence commenced. In a majority of cases, however, in from twenty-four to thirty-six hours after the operation of the calomel, the dysenteric symptoms returned, though in a decidedly mitigated form, there seldom being any severe pain or griping (when a second dose of calomel was given; but generally the case was completed by a drachm or two of oil, or a few small doses of opium or Dover's powder). In but very few of the cases did the mercury produce any ptyalism, or any decided affection of the gums, and in no case did it produce any severe mercurialization. The dose was given in forty-seven cases, and seldom repeated, showing a marked difference in obstinacy, in epidemic dysentery here, and that which prevails in India. There, also, ptyalism was generally induced before the symptoms entirely yielded. Since the publication of this paper on dysentery, I have discovered, from a larger acquaintance with the use of calomel in full doses, that *half-drachm doses* are, for adults, *safer* (that is, less apt to irritate, and not more apt to

salivate) than the scruple-doses. In fact, it is well always to bear in mind, when using the "calomel treatment," that there is more danger in giving too little than too much, or (to speak definitely) in giving less than twenty grains, than a little over thirty.¹ I have never thought it justifiable to attempt to ascertain to what extent the dose may be increased without doing injury, since a larger dose than half a drachm I have not yet found necessary. But writers of high repute have exhibited forty, fifty, and sixty grains, with the best effect in desperate cases. Prof. W. Parker once mentioned to me a case which occurred under his observation many years ago, in which a delicate child, almost hopelessly ill with "membranous croup," took, in three or four days, *half an ounce* of calomel in scruple-doses, and recovered perfectly. There does not appear to be such a thing as a *poisonous* dose of calomel. Yet, according to Parrish ("Pharmacy," article *Calomel*), ptyalism may be produced by one grain divided into twenty-four doses, and might thus do more injury than forty grains in one or two doses, so singular are the reactions of this powerful agent on the system.

Calomel exerts its sedative power almost if not quite as remarkably and successfully in "membranous croup" as in dysentery. Indeed, judging from my own somewhat limited experience with it in this disease, I may ascribe to it, in proper doses, and aided by such appliances as will keep at bay the urgent danger while the calomel is acting, the powers of a *specific*. Should this prove, on sufficient trial (which it has never had), to be the case, what a boon is it!² Before this

¹ Johnson speaks of a scruple as the maximum dose, and cautions against an increase. My own trials of the remedy, as has been remarked, led me to a different conclusion. And Prof. Dickson says of this caution: "We smile at this attempt at precision. It is not permitted, at the present day, to talk of a definite limit in the exhibition of any article of the materia medica, or to venture to predict the effect of whatever additions to the established doses of ancient formulæ."—*Dickson's Practice, Art. Dysentery*.

² It is somewhat singular that the writer should have met with quite a number of cases annually of true croup during the first ten years of practice, and that during the last ten years it has become quite rare, although the infant population has increased. During the past five years, he has not averaged more than one case per year, both in his own practice and that of his assist-

treatment was recommended to me by a medical friend in New York, one of the most distinguished teachers there, the fatality among my cases of "croup" was such that I trembled when called to a case. And this has been the experience of all those who have had a large acquaintance with the diseases of children, and who have been careful to distinguish the true from the spasmodic variety. Dr. Ware, a high authority, states that nineteen out of twenty die. When *tracheotomy* has been resorted to sufficiently early, as it is not apt to be, a larger proportion has been saved. But, if we have not, in sedative doses of calomel, a remedy for membranous croup, we certainly have in no other drug or combination of drugs.¹ Various articles, mainly of the depressant, nauseating, or emetic class, have been lauded, as particularly successful in croup, by different practitioners from time to time. They generally only palliate distress, however, but lengthen the agony, as a fatal result pretty surely ensues. Unfortunately, it is not an easy matter to distinguish true from false croup, until quite late in the disease. I am speaking from my own experience, as most authorities, except Vogel, would have their readers believe it comparatively easy, even at the outset of the disease. In true croup it is rare to see the membrane, at any stage of the disease, *in the fauces* (except in the *diphtheritic* form, when it is almost always visible), and not very common to see it in a distinct form in the expectoration; and if not seen, the true nature of the case cannot be surely diagnosticated but by its progress and the result of the treatment employed.² If a case

ant, and this accounts for his limited opportunity for testing the calomel treatment properly.

¹ Among the latest writers on diseases of children, Dr. J. Lewis Smith says: "It is uncertain whether it does exert any controlling influence upon the progress of croup." He does not state whether he has had any experience with the "heroic" doses.

² "The reason for these diverse statements," says Vogel, in his recent work on "Diseases of Children," "is found in the diversity of the anatomico-pathological processes. In the one case, croup is produced simply by a plastic exudation within the *larynx*, which does not generally extend above the *epiglottis*. In the other by diphtheritis, which almost always occurs simultaneously upon the tonsils. In France, especially Paris, it is rare to find a child with croup, and without diphtheritic patches on the tonsils;

commences rather moderately, the symptoms continuing, though in a mitigated degree, through the day, finally becoming alarming; and if, after a successive and thorough trial of the usual remedies, external and internal, including, of course, as frequent emesis as the patient's strength will bear, the symptoms do not yield, but, on the contrary, increase during day and night, with perhaps short intervals of temporary relief, we had better infer that we have a case of "croup," and abandon the emetic and depressant treatment as worse than useless. The writer has never made use of the "calomel treatment" in any case of this disease until a fair trial has been made with the ordinary remedies. Indeed, in most of the cases so managed, he has been called in consultation by other physicians *in consequence* of the failure of treatment. His first experience was in the case of a boy about five years of age, in a family where a number of children had died from year to year, some of them from croupal affections; not one had ever recovered from the latter. My then assistant, Dr. Hardaway, formerly house-physician at Bellevue, an accomplished physician, had charge of the case, and, having exhausted all his ingenuity and resources, and apprehending a fatal result, summoned me to the case. We immediately commenced giving scruple-doses of calomel. It was bedtime when the first dose was given; and several similar doses were left with the mother, with directions to administer one in syrup whenever the paroxysms (dyspnoea) should become alarming. In the morning we found the child very much better; cough becoming loose, and inspiration quite easy. The mother stated that, within half an hour from the time the first dose was given, "the child fell into a *quiet sleep, and breathed easily*;" that in a couple of hours he aroused, and the paroxysm became quite urgent;

while, in Munich and vicinity," he states that "the reverse is the case." This accounts for the fact that no less an authority than Niemeyer, in his late work on "Therapeutics," diagnoses *croup* by white patches early appearing on the tonsils, evidently diphtheritic croup.

Dr. Edward Ellis, of London, in a recent work on "Diseases of Children," commences his description of "croup" with this sentence: "This disease is very alarming in its symptoms, contagious, and very fatal." He would hardly use the term *contagious* with reference to ordinary membranous croup.

whereupon she gave a powder, with a similar result. And so she found it necessary to continue until he had taken four doses (eighty grains) in ten hours. Suffice it to say, that he was threatened slightly once during the day, and a scruple more was given as a precaution; and, on the following day, he was quite well, except a slight affection of the gums, which yielded within forty-eight hours to chlorate of potash. The only cases of which I kept full notes are the following; for it must be confessed that, in my first cases, I had so little expectation of any such results, notwithstanding the responsible authorities by whom the treatment was recommended, that it did not occur to me to keep notes. The case of J. G., although long, is given in full, because it illustrates the proper method of employing what the writer considers the two most important means of cure in the disease, means which are so seldom properly handled; and the necessity of the physician's superintending their details personally, and carrying them out thoroughly. Another precisely similar case occurred during the same winter, and singularly enough, in the next house, in a stout child of about the same age, who was treated in a similar manner, except that the steam was not so perseveringly applied, and that *fumigation* with calomel seemed to aid its internal administration. This case also recovered. It is interesting to mention that he had been so thoroughly and constantly vomited and purged by the alarmed parents, when I could not be found, as to render it very difficult for him to retain even calomel on the stomach, which, when it was retained, checked promptly both the emesis and cartharsis without recourse to any opiate:

J. G., a stout, healthy boy, three years old, became fretful and ailing on January 16, 1867. On the 17th, had a cough, which at eight became "croupy," and the respiration also. His mother administered paregoric and syrup of ipecac., with the effect of vomiting him two or three times, and with some relief to the symptoms. 18th, A. M. No better. Had what his mother called a "spasm" from difficulty of breathing, and was vomited again. Dr. B. A. Segur, formerly house-physician of Bellevue, now of Brooklyn, saw the case in the afternoon, in my absence from home. He had had a recurrence of the *dyspnœa*; and Dr. S. advised a continuance of the medicine, with the addition of the inhalation of the vapor of boiling water. He also gave a mercurial cathartic (5 grs. of calomel).

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19th, A. M. Doctor hurriedly summoned, and found him much worse, although he had been repeatedly vomited. The vapor had been applied rather inefficiently. The cathartic had produced two very dark evacuations. The doctor now remained with the patient, and superintended the steam arrangements himself, and soon had the room *filled* with the vapor, and conducted directly toward the child's face by a thick paper tube. In order to generate large quantities of vapor, large cobble-stones were heated to redness in a range, and put into a tub with some three inches or so of water in it. These were changed every few minutes day and night. The temperature of the room was kept at 73° to 74° F.; the thermometer outside the house ranging from 3° to 10°. The heat of the room was maintained almost entirely by the steam, only a very little fire being kept up. In consequence of the extreme cold externally, the steam rapidly condensed, and ran down the walls in streams, and, after twenty-four hours, dropped from the ceiling, rendering it occasionally necessary to wipe the latter dry. All the bed-clothes and curtains were thoroughly dampened. Those about the child were occasionally changed as they became very damp.¹ During the day, had the croupy cough and respiration, but was easier, and laid more quietly in his crib. Toward evening the symptoms grew more threatening. Inspiration interrupted. At this juncture, the writer returned and took charge of the case. 6.10 P. M. Determined, Dr. S. concurring, to try the "calomel treatment." Gave a scruple. 8.45 P. M. Half an hour after dose, breathed somewhat easier; but has been restless; has slept almost none for forty-eight hours. Gave ℞ calomel ℥i, pulv. Tullii gr. iv. ℥.

January 20th, 5 o'clock, A. M. He slept almost all night, except when aroused to take beef-tea, which has been given regularly at stated intervals. Has just had one dark, slimy evacuation. Is sweating profusely.

20th, 5 o'clock, P. M. During the early part of the afternoon was quite playful, voice better; respiration still croupy, but with no painful effort. Sweating profusely now, dull, feeble, languid; pulse feeble and irregular. Respiration becoming *hurried*. ℞ spts. vini gall. 3 i q. 2. h. Also fumigated with calomel 3 ss. This produced intense irritation of the air-passages, and a most incessant and harassing cough, which failed to detach any membrane or to relieve the *dyspnœa*. Pulse 130 to 140, but stronger from the stimulant. Finally, was compelled to prescribe Tully's powder.

January 21st, 1 o'clock, A. M. Is very restless. Skin now dry, respiration *hurried*, and stridulous; pulse less frequent. Deglutition is so difficult at times, that the nourishment and stimulant are now given *per rectum*. ℞ calomel ℥i, p. Tullii gr. iij. ℥. Has had two dark, greenish evacuations within the last twelve hours. 7 o'clock, A. M. Has been quiet, and sleeping part of the time. Cough croupy still, but less harassing. Pulse still frequent. Skin dry. ℞ calomel ℥i. 9 o'clock, P. M. Half an hour after the last dose, symptoms began to improve. Seemed to

² There is no danger from dampness, provided a high temperature is kept up.

get rid of some obstruction after coughing hard. Pulse better. Respiration becoming less hurried and easier; one dark, greenish-yellow evacuation. 2 o'clock, P. M. Improving. Stop stimulant. 6 o'clock, very lively; voice almost natural. Air enters lungs much more freely than it has done at any time. (The vapor has been persistently kept up day and night, it being at times difficult to distinguish between persons across the room, by candle-light. During the last few hours, it has been allowed to decline a little.)

January 22d, 1 o'clock, A. M. For two hours, has been restless, but not apparently suffering. Respiration slightly dry, and croupy. Skin pleasant. Has swallowed his beef-tea with less resistance during the night. R calomel ℥i, p. Tullii gr. ijss. ℥. 22d, 7 o'clock, A. M. Went to sleep an hour or so after the dose, and has slept until an hour ago. Breathes easily, but cough is still slightly croupy. Had one evacuation like the last this morning. Skin more moist; pulse fair. Brandy 3 ss. q. 2 h., as he seems rather languid. 6 o'clock, P. M. Rapidly improving. Respiration almost natural. To stop vapor. Takes some solid food with relish. To take R pot. chlorat. gr. vi. quin. sulph. gr. ij ℥ ter die.

January 23d, a little restless and peevish, but looks well. Respiration perfectly natural. Pulse rather feeble. Two dark-green evacuations. From this time he convalesced rapidly, and in a few days was in his usual health, and has never been sick since.

F. D., aged five years, previous health good, except an attack of "whooping-cough," of several weeks' duration, of a mild character. Had been suffering from a croupy cough for two or three days, the result of a wetting, when, at 3 o'clock, A. M., January 28, 1869, his mother was alarmed by a sudden increase of the *dyspnoea*, and commenced dosing him vigorously with syrup of ipacac. and paregoric. This was kept up assiduously until 9 o'clock, P. M., of the same day, when I was called. The medicine had vomited him several times; the anodyne had induced considerable drowsiness, and he had slept at intervals, but the symptoms grew worse. There was nothing unusual about the fauces, and but little fever. Pulse feeble. Had kept little or no nourishment on the stomach through the day. Deeming it useless to continue the nauseating remedies any longer, it was resolved to try the specific treatment for croup, and calomel ℥i was at once given, with directions to continue every two hours *until the symptoms abated*, or until the characteristic evacuations were observed. It was also directed that the crib should be surrounded by a thick canopy, under which steam should be constantly introduced by a generator provided for that purpose.

January 29th, 7 o'clock, A. M. Has had three doses of calomel, and the vapor was kept up until near daylight, when, as the symptoms appeared much less urgent, it was omitted. About a quarter of an hour after the first dose of calomel, the child vomited, as he had been doing for the past eighteen hours, soon fell asleep, and breathed easier than he had done for

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twelve hours. He subsequently had a recurrence of the symptoms, and a second powder was given at 3 o'clock, A. M., and again, on a further recurrence of the symptoms, at 5 A. M. Soon after this the improvement commenced. He is now breathing easily, and feels much better. Cough croupy, but loose. Still nauseated; one evacuation, formed, and dark green. To continue steam, and to give the calomel on a recurrence of paroxysms. Dr. Murdock, my assistant, now took charge of the case.

January 30th, Dr. M. reports that, by mistake, the mother gave a powder (calomel \mathfrak{D} i) at 9 o'clock, A. M., yesterday, and that the steam has been kept up until this morning; when, the cough being loose, and the croupy respiration having entirely disappeared, it was discontinued. The last dose was followed by loose, dark-green, and slimy evacuations, when the nausea immediately disappeared, and he called out for toast, which he took with relish, and he has had no nausea since. Pulse, which was quite feeble throughout the attack, is now much stronger. Took eighty grains within twelve hours.

May 30th, three months after attack. Has continued in perfect health ever since.

Membranous croup has been treated, by scruple-doses of calomel, by some of our most distinguished physicians and teachers of medicine in New York City, for nearly twenty years, and is still relied upon by some, but to what extent it is difficult to say, for any published allusion to such treatment is very rare; though, in private conversation, these gentlemen speak of the treatment as more to be depended on than any other. In fact, the prejudice against calomel, especially in large doses, is still so great, both among the profession and the laity, that few men care publicly to proclaim the extent of their confidence in its curative power. The introduction of the calomel treatment in croup is ascribed, in New York, to Dr. Bay, of Albany.¹ But Hamilton, in his work on "Mercury," published in the early part of this century, says that American physicians have been using it in croup as the chief remedy, and that its use spread thence to England. I can find no mention made of large *doses*, but large *quantities* (one hundred grains and upward) were required to produce the effect.²

¹ Prof. Potter, of Baltimore, was also in the habit of using it in "enormous" doses, and he claims with "uniform" success.

² The American editor of Hamilton, Dr. Ives, remarks, in a foot-note: "I know it is said, by Dr. Chapman, that some of the respectable practitioners, both of this country and of Europe, *trust exclusively to calomel* in croup; but, if there be any who are thus presumptuous in their practice in this country, they have not had the courage to publish it to the world."

It is interesting and instructive to quote what an author of such renown, and who has written the most systematic treatise extant, against the use of calomel in disease generally, has to say of his experience in the calomel treatment of croup. Recognizing the futility of blood-letting, emetics, purgatives, blisters, etc., etc., and of the ordinary mode of using calomel, Prof. Hamilton was induced, by a medical friend, to give the American treatment, as he styles it, a trial. "At any rate, he can solemnly assert," he says, "that, according to all he has seen, no relief whatever has been afforded by that medicine, unless copious dark-green colored stools, like boiled spinach, have been discharged, and that it requires *large and repeated doses* of the medicine to produce that effect. For example, to a child of seven years old, one hundred and thirty-three grains were given within sixty hours." He further says: "In the only cases in which this medicine has failed under the author's direction (being in the proportion of *four* out of *fifty*) no evacuation, through the bowels, could be produced. . . In reasoning on this subject," he continues, "it is extremely difficult to explain, in the first place, the safety with which a hundred and thirty-three grains of calomel could be given in this climate (England), within sixty hours, to a child of seven years. Secondly, the relief which has invariably followed the discharge of the dark-green colored evacuations." The loss of only four cases out of fifty is the most remarkable success that I have seen recorded. These remarks of this author give the clue to the effectual employment of calomel in croup; that is, *to continue the remedy until permanent relief is obtained*, or until free evacuation of the stools just described. But the peculiar *sedative* influence, which we have witnessed from the scruple-doses, is not obtained from the small doses, however frequently repeated. He goes on to state that "considerable weakness remains after the crouping has ceased, partly from the violence of the symptoms, and partly from the operation of the calomel." He adds that "he has seen two cases where the patients sunk from the weakness which followed." But we must not allow our patients to sink. It has been seen, in the case of J. G., how suddenly weakness may supervene, and how promptly, also, it can be coun-

teracted by timely stimulation. It is not fair, however, to ascribe this weakness to the remedy, except to a slight extent, since we observe no such debility ensue from similar doses in any but these fatal and prostrating diseases. In coping with so deadly an enemy as this, no judicious physician would omit to employ all the weapons at his disposal, in case of necessity, whatever his reliance on any special one; and, although the author of this paper believes that calomel alone, if not too long deferred, and boldly repeated when required by the symptoms, is capable of curing the disease, yet it has been seen that he does not, in any case, fail to use the most effective adjuvants; and he begs leave again to direct attention to what he considers by far the most important of these, and to insist on as bold a use of this as of the calomel, as the only means, not only of securing any benefit, but actually of avoiding injury. If no special apparatus is procurable, and the room be not large, it may be filled with vapor, as has been described in the case of J. G. But this can only be done where there is a range or very large stove, and a strong man always at hand, for days if necessary, and therefore not in the dwellings of the poorer classes. A very simple contrivance, which any tinman can furnish at a moderate expense, will answer admirably. It consists of a boiler of the size of a large tea-kettle, with a long shifting spout to conduct the vapor under the bed-clothes, or canopy, a tin stand for it, and a large tin spirit-lamp, holding about a quart, with three or four large wicks. This can also be used for giving a vapor-bath and a copious sweat in Bright's disease, etc., by putting hoops over the patient, as he lies in bed, and the clothes over these; or, if not too sick, he can sit on a chair with a blanket drawn around him closely, and secured about the neck. The first record of the efficient use of this agent in croup, which came under my notice, was a case published by my friend Moreau Morris, M. D., now connected with the Metropolitan Board of Health. It is very easy to separate the effect produced by this and other adjuvants in the above cases, from that produced by the calomel. The great benefit derived from the steam is the *present relief of dyspnœa*, and the prolongation of life, in obstinate cases, while the calo-

mel is silently producing its curative effects. It is easy to see, by a study of these cases, that vapor alone will not cure.¹

In *epidemic cholera* the effect of sedative doses of calomel is sometimes more marked than in any other disease. Since his attention has been directed to this subject, the writer has not had an opportunity of testing it in many cases personally. In the stage of violent cramps, he has found it advantageous to inject half a grain of morphine, hypodermically, and repeat, if necessary, until they are subdued, then to give calomel in half-drachm doses. Calomel has this advantage, in cholera and similar affections, that it is almost the only remedy which can be borne on the stomach. Mr. Jamieson, in his report to the British Government, on the disease as it appeared in Bengal in 1817-'19, says: "Although it cannot be affirmed that calomel possessed any especial power in checking the disorder, it was undoubtedly frequently useful in checking irritability; and was, perhaps, of *more certain sedative action* than any other medicine." The practice of giving scruple and larger doses of calomel in cholera was very general among tropical physicians; but they frequently premised copious bleeding, and often gave considerable *laudanum*. The most complete exhibit of the effect of calomel, *per se*, in cholera, is furnished by Dr. Vanderveer, of New York, in his report of the Franklin-Street Cholera Hospital opened during the epidemic of 1854, and under his charge, assisted by Dr. (now Prof.) C. A. Budd, and Dr. Richards.² In the first stages of confirmed cholera, he gave thirty-five to forty grains, and used hot applications. If the dose was rejected by the stomach, it was repeated in five minutes, "and so on until emesis ceased, or we saw some signs of the medicine, or judged a sufficient quantity had been retained to proceed at regular intervals with diminished doses. In the stage of *collapse*, we gave sixty grains, and if they

¹ Dr. West ("Diseases of Children") makes the remark that "the action of mercurials is far too slow to overtake a disease which tends so rapidly to a fatal issue," but evidently refers to the ordinary methods of using the remedy, and does not appear to place any reliance on the scruple-doses, or does not refer to them at all. For no other remedy, in this disease, acts so promptly.

² New York Journal of Medicine, September, 1869.

vomited soon after, and the medicine could be detected in the vessel, we repeated it at once, and so on until the third or fourth dose was administered. Frequently, if vomiting did not ensue, one dose would be sufficient." He says, with reference to any fear of purgation: "I have never met with a case of cholera, treated as above stated, and hypercatharsis ensue; on the contrary, it has frequently occurred that patients, both in hospital and private practice, have been seized with violent vomiting, purging, and cramps, which had, from their own statement, been kept up every ten minutes for one, two, and three hours; and, after taking sixty grains of calomel, have not vomited or purged for six, ten, and twelve hours after; and, in two or three instances in the hospital, after waiting twelve hours, resorted to mild enema to open the bowels." He further says: "I have found calomel in large doses more sedative (than cathartic) in its effects, and that its cathartic action does not increase in proportion to the increase of the dose." As regards his results, nearly one-third of the cases were received into the hospital in a state described as "profound collapse," some of them pulseless at the wrist. Of these, nearly *one-third* were saved. Of those in "partial collapse" over one-third, and this under rather unfavorable surrounding circumstances.

In violent *cholera morbus*, with excessive irritability of stomach, when, in fact, nothing else could be retained, I have given a scruple to half a drachm of calomel, with the effect of checking all the symptoms very promptly. I have had but little experience with the sedative doses in other diseases than those above enumerated, but am convinced that we have yet a good deal to learn of their value in various other complaints, especially in those attended by sudden congestion of the viscera. To a lady, who had had repeated attacks of diphtheritic tonsillitis, generally lasting several days, and attended by considerable debility, as they usually are, I gave twenty-five grains at the inception of one of her attacks; the next day, she was much relieved, and the attack was apparently aborted. Mrs. H. P., aged thirty-five, of rather delicate organization, was attacked, a couple of weeks since, with chilliness, violent pains "all over," sore-throat, and debility. The fauces were inflamed, the tonsils swollen, and showing patches of diphtheritic exuda-

tion. I administered thirty grains of calomel, and small doses of chlorate of potash were directed at intervals, more as a placebo. Dr. Murdock saw her, for me, the next morning, and found her very much relieved. She did not require another visit; and was neither purged nor salivated. It is known to many of the profession in New York that it was the practice of the late Dr. Cammann, one of the ablest diagnosticians and respected practitioners that we have had, to administer heroic doses of calomel (twenty, forty, fifty grains) for the purpose of aborting sudden and dangerous attacks of thoracic disease, and with success. In one instance, says his friend Dr. J. R. Leaming, in a recent letter to the writer, he gave a large dose to a patient with a tubercular cavity, and who had been suddenly attacked with extensive pneumonia on the diseased side, and was in a very critical condition. "In the morning," says Dr. L., "he was quite relieved, and the pneumonia aborted. The patient is yet alive, and Dr. C. has been dead these six years." Dr. Leaming's attention was, like that of Dr. Johnson, first called to the good effect of the calomel treatment by its result in his own case. I hope he will pardon me for giving his own words. "I was taken," he says, in a letter to the writer, "while at lectures, with a violent chill, and pain in the head and back, got to my room as soon as possible, and prevailed upon a student to give me twenty or twenty-five grains of calomel. That was on Thursday, and, on Sunday following, Prof. Dickson saw me and recognized typhus fever and also the happy effect of the calomel; but advised us not to follow out that treatment on our patients when we got into practice. I was at lectures again in two weeks." He states that he has used the same treatment since in "fever," when the *prodromata* were violent, and always beneficially.¹ In a paper on "Pleuritis," read before the Academy of Medicine recently, Dr. L. states that he uses the large dose, twenty, thirty, and forty grains, "not for its purgative, nor yet for its constitutional

¹ Dr. Leaming is not alone, even among the latest writers on therapeutics, in his opinion of calomel in low fevers. Dr. Sidney Ringer, in his recent work on "Therapeutics," says: "Typhoid fever, according to very high authorities, among whom may be mentioned Dr. Parkes, may be most beneficially influenced by small doses of calomel."

effect—the former is undesirable, the latter disastrous—but to produce a profound impression upon the great organic nervous system." This he relies upon, with the *juvantia*, to abort the inflammation, and "prevent serous effusion, and deposit of lymph, with their train of serious evils."

Let us now, as briefly as possible, review the opinions of authors, especially on tropical diseases, who have employed this remedy, with regard to its object, its *modus operandi*, and its mode of administration, and endeavor to reconcile the discrepancy of results, which has so greatly tended to bring this system into disfavor within the last decade. It will be observed that these writers now and then use the term *sedative*, and that Johnson and Annesley incidentally distinctly claim this action, as does Dr. Vanderveer. But all these writers seemed to rely more on its alterative power, and especially its peculiar action on the mucous membrane of the intestines and on the liver; most of them aiming at ptyalism, mainly, however, as an index of its proper action on the system. Dr. Leaming claims for it a distinctly sedative power, and a power of producing a prompt, a profound, and a favorable impression on the sympathetic system of nerves, tending to abort, or to render dangerless, those violent forms of disease, some of which have been alluded to in this paper, and of whose behavior, under this treatment, we have furnished illustrations. It has been with these views, and in such cases usually, that the writer has employed this treatment for a number of years. Headland, one of our highest authorities on the action of remedies, positively denies any sedative power to these doses, and rejects them altogether.¹ Stillé, and most others of the later authorities, agree with Headland's views.

¹ This author, while disapproving of the large doses, not as dangerous, but as simply useless, because, as he claims, not absorbed, still evinces great confidence in the remedy in small doses. "The more we know of its real actions," he says, "of the mystic processes of its absorption and operation on the system, and of the comparative physiological tendencies of the various forms in which it is administered, the better shall we be able to wield it with skill and effect. In a line of investigation, and of patient experiment on disease and remedy, lies our best and wisest course." He evidently permits his *theory* (of non-absorption) to prevent a personal trial of sedative doses.

The fact has already been alluded to that, in their management of dysentery, cholera, etc., the tropical physicians were in the habit of premising bleeding, and frequently of quieting irritability by combining a moderate amount of laudanum with the use of calomel; and many might infer that the sedative effect attributed to this remedy was due mainly to those powerful auxiliaries. It is very probable that the venesection caused a more prompt absorption of the remedies subsequently administered, but it is also very probable that it was at the cost of rendering the disease more tedious, and rather of impeding the ultimate favorable action of the calomel; at all events, the experience of the last twenty-five years has proved this in temperate climates. Laudanum, and sometimes solid opium, was given occasionally, at the inception of an attack, to quiet urgent symptoms; but it was generally avoided as interfering with the proper action of the calomel. I have not unfrequently observed that, in cases of obstinate fecal impaction of the *cæcum*, when various laxatives, enemata, etc., have been continuously used without effect, until the pain and increasing exhaustion of the patient forced their discontinuance, a full dose of morphine would give a few hours' relief, and perhaps sleep, to be followed by a copious discharge from the bowels. Yet the cure is not attributed to the anodyne. Thus, in the case of J. G., small doses of opium were given for a special purpose (the only case in which the writer has been compelled to associate it with calomel in croup), but no one can, after a careful scrutiny of that case, attribute more than a very subordinate, though an important agency, in the cure, as important perhaps as the stimulant. In my cases of dysentery, the calomel was uninfluenced, as a very general rule, either by bleeding or by opium, neither was salivation considered desirable, yet my results were precisely similar to those obtained by the tropical writers. So were Dr. Vanderveer's.¹

¹ It is worthy of note that it is claimed by Cunningham and some others that hepatitis and hepatic abscess are much less common *sequelæ* of dysentery when the latter is treated by the large doses of calomel. He states that, although the disease prevailed to a greater extent in his ship (Sceptre) than in any other in India, yet not a single instance of hepatitis, supervening on this disease, occurred. “In the Albion and Russell, where much less calomel was used, liver-complaints were very prevalent.”

Although, as we have seen, it is occasionally necessary, in the rapid and fatal forms of disease to which, as a general rule, this treatment is adapted, to call in every auxiliary which may afford any relief, however temporary; still, any other drug, capable of producing any powerful impression on the system, is to be avoided as far as possible when the calomel treatment is being employed.¹ To a non-observance of this rule may be attributed a good share of the failure of those who have thought they were carrying out, in good faith, the precise rules recommended by the originators of the practice. Sir Henry Holland ("Medical Notes and Reflections") says, "Its good effects are much impaired by admixture with other aperients." It is still more impaired, as a general rule, by combination with opium, except when employed in the common method, that is, small doses frequently repeated, in which case the combination is rather beneficial than otherwise. The alleged success of Johnson, Annesley, Cunningham, and others, with the sedative doses, induced multitudes of other practitioners to try them, and to go much further than they ever deemed it necessary or safe to do, giving the scruple doses every hour, two hours, etc., as a routine practice. These writers take pains especially to denounce this abuse of the treatment, as they do the idea that pyralism is the *sine qua non* of its success.² "But there is an abuse," says Holland, "also on the side of timid and deficient employment where its decided and speedy influence is required. This is often forfeited by using it in those small and scattered doses which harass the bowels," etc. It is not uncommon to hear physicians talk of having used the "calomel treatment," or to see written accounts of it, where the doses did not exceed ten grains, a dose too large for the good effect of the fractional-dose treatment, and too small to produce other than irritating instead of sedative effects. Another cause of alleged injurious effect of the large doses, and which I have not seen noticed,

¹ Such remedies as opium, laxatives, astringents, etc., are here referred to. Tonics, sudorifics, stimulants, nutritives, etc., are not only not contra-indicated, but often assist very much.

² See James Johnson, "Influence of Tropical Climates on European Constitutions;" and Annesley, "Sketches of Diseases of India."

has probably arisen, in former days especially, from the uncertain quality of the medicine. Even at this day, when so much more attention is paid to the purity of drugs, we occasionally hear of calomel contaminated by various impurities, even by corrosive sublimate.

The action of calomel, in large doses, has been constantly spoken of in this paper as a *sedative* one; and its initial, if not its principal influence over such forms of disease as have been here discussed, must be due to a tranquillizing action on the ganglionic system of nerves, as evidenced by the promptitude and character of its effect. But it is not claimed that this explains or comprehends, by any means, its entire *modus operandi*, in the ultimate cure. The explanation of this has puzzled much more able observers than the writer, and baffled much keener intellects than his. One fact, with regard to its action, we know from Annesley's experiments on living animals,¹ where one, two, and three drachm doses were given; and from Beaumont's observations in the case of St. Martin, that calomel relieves hyperæmia of the alimentary canal; and this explains, to a certain extent, its action in the affections of this membrane.² But its power over such a disease as croup is not so explicable. Dr. Rush thought that it acted by a counter-irritant effect on the intestines. But it is not, by any means, always necessary to carry it so far as to produce such counter-irritation, nor will that, produced by other and more drastic cathartics, produce any such result.³ It has been long

¹ *Op. cit.*

² "Mr. Cunningham took, when in perfect health," says Johnson, "by way of experiment, three scruple-doses of calomel in one day." The sensations along the tract of the intestines he describes as rather pleasant than otherwise, and they were followed by "one natural stool in the evening."

It has been already stated that Billing claims for it a power of contracting the mucous capillaries, and that Headland denies it.

³ Of course, a good deal of its beneficial influence in this and other diseases has been attributed to its *cholagogue* effect. It has, however, been recently demonstrated, by a long series of experiments carefully conducted, that, on *healthy* animals, it not only does not stimulate an increased flow of bile, but actually diminishes it. It is to be expected that so powerful an impression, as calomel is capable of producing, *might* interfere with the harmonious action of the abdominal viscera (in a state of health); and

claimed that it diminishes the plasticity of the blood, and in so far may aid in subduing such a disease. Its action has also been attributed to sympathetic influence, such as is exerted between similar organs and similar tissues, as explained by Bichat. We know that an irritant to the conjunctiva of the eye will induce sneezing; that irritation of the *membrana tympani* will provoke violent cough; that irritation of the uterine mucous membrane will induce vomiting; and that vomiting, *per contra*, will induce contraction of the uterus, and thus check hæmorrhage; in fine, that it is not improbable that, along with its other influences, calomel acts on the mucous membrane of the *larynx*, through the intestinal lining, by means of that remarkable reflex phenomenon of the sympathetic system enunciated by Marshall Hall, and which, through the labors of Brown-Séquard and others, has rendered explicable many intricate physiological and pathological problems.

In conclusion, and to guard against any misapprehension of the writer's views respecting the mercurial treatment of disease generally, and consequently of any misrepresentation of the same to his discredit, he begs to state that he is as much opposed to its indiscriminate use as an alterative, that is, in minute doses with a view to mercurialization, as almost any one can be. One of his first essays,¹ on entering upon practice, nearly twenty years ago, was designed to show on what a slight foundation the *prophylactic* use of mercury in primary syphilis stood. Yet, at that period, its employment for that purpose was very general, especially among the older practitioners.² He will go so far as to say that, with the powerful

yet, as Dr. Ringer remarks (*op. cit.*) "may act in disease as a cholagogue by setting aside the conditions hindering the formation of bile." The liquefaction of the viscid secretions coating the *duodenum*, and their removal, which calomel effects, thus clearing the outlet of the *ductus communis*, a continuous action along this tube, and the consequent relief of a distended gall-bladder, may emulge the overloaded ducts of the liver, and thus *indirectly*, but perhaps no less efficiently, act as a cholagogue; whereas, in health, no such series of actions could be expected.

¹ Medical Notes and Observations, New York Journal of Medicine, 1852, p. 61.

² Headland, in his last edition, remarks that mercury is useful in both forms of syphilis; and Sidney Ringer, still later, remarks that it is still

modern remedies which enable us to promptly act on the nervous system, and to control the action of the heart, and which our predecessors a few years back had not, calomel, as an alterative, is, to say the least, unnecessary in all forms of fever, in most diseases of the liver and alimentary canal, and also in peritonitis, iritis, pericarditis, and allied affections, in the treatment of which this remedy has, until quite recently, been considered indispensable.¹ But, to ignore the powerful influence for good which calomel exerts in sedative doses, in some of the forms and phases of various diseases, and as a means of arresting the progress of certain diseases of a more than ordinarily dangerous character, especially where other agents are generally admitted to be futile for this purpose, and where we have such convincing evidence, from such responsible sources, scattered over our medical histories; to cast aside the *good* which so valuable an agent is capable of effecting, when properly employed, because the evil of its *abuse* has been so great; to yield to the clamor, which is rather becoming traditional, that to use calomel in efficient doses is an evidence of old fogysm, or of a failure to keep up with the rapid strides of medical science, is, in his opinion, scarcely less unphilosophical and reprehensible than to use it, as was formerly done a century ago. The best, the most potent of our weapons against disease, are, of course, those most liable to abuse. *Opium*, the greatest of all our remedies, *magnum donum Dei* of Sydenham, is an instance of this. The trained soldier, when he goes into battle, does not reject the most effective weapon, because it has proved unsafe in rash or unskilful hands. Neither should the intelligent and observing physician allow any prejudice or tradition, however honored by time or abused by many physicians in both forms of the disease, and that it is supposed to render the secondary effects less severe.

¹ Nevertheless, the writer deems it just to say that the injurious effects of mercury on the system have been much exaggerated, as every one acquainted with the subject must admit. Niemeyer, in this connection (*op. cit.*), remarks: “An exceedingly rich experience has taught us that the innumerable multitudes of persons, who have used calomel more or less for other purposes than anti-syphilitic, have not suffered any permanent injury to their digestive organs, or their general health, but are now as healthy as they ever were.”

thority, to stand between him and the judicious trial of any means of combating disease rebellious to our ordinary weapons, or our ordinary method of employing them.

Immediately after the adjournment of the Society, the writer was informed, by a member, that another member, Dr. Knapp, while practising in the eastern part of the county some years ago, had a case of croup under treatment, which was, to all appearance, in a desperate condition; at this juncture, the friends insisted on calling in an old practitioner from Connecticut, who happened to be in the neighborhood. He immediately prescribed *teaspoonful doses* of calomel, and the child recovered after taking several. It is probable that this was considered a sort of accidental hit, by all the physicians acquainted with the circumstance, as the relator did not seem to have been at all impressed with the importance of the occurrence, until his attention was recalled to it by the facts related in the above paper. The manner in which the treatment of "croup" by "heroic" doses was introduced into the city of New York by Dr. Bay, or reintroduced, was almost precisely similar, and occurred in a case under the treatment of Drs. W. Parker and F. W. Johnston. It seems to have been considered rather as a "hit," than the result of previous experience. Another member mentioned the case of his own wife, in corroboration of the facts adduced in the paper. She was attacked, during the prevalence of the *cholera* in 1849, by dysentery; wishing to check the discharges promptly, the doctor prescribed moderate doses of morphia. The discharges were not arrested before a peculiar affection of the brain set in, which the doctor ascribed to congestion (there were no evidences of narcotism). He immediately prescribed a scruple of *calomel*, not for any specific effect, but simply to control this symptom; she was promptly relieved; and, to his surprise, had no passage from the bowels until the morning after, and then a regular, healthy evacuation.